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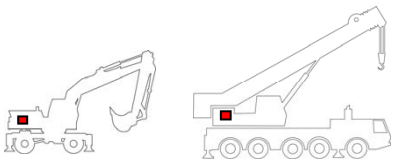
1 Product Description

The hydraulic system of a mobile work-machine normally consists of at least two hydraulic circuits: The high-pressure circuit used for controlling the hydraulic attachments and the main functions, and the pilot control circuit that controls the valves of the main circuit.
This proportional pressure relief valves are meant to be built into the pilot control circuit.

1.1 Application

The pressure relief valves are used for the electrical-proportional control of a main control valve. This can replace a purely hydraulic pilot control valve and it can be used for expanding a hydraulic system for operating additional attachments. Potential applications are actuating proportional shear controllers or priority valves.

1.2 Mounting location (Recommendation)

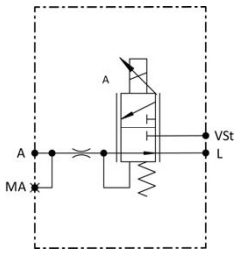


The location for mounting should be chosen close to the main function to be controlled.

1.3 Function

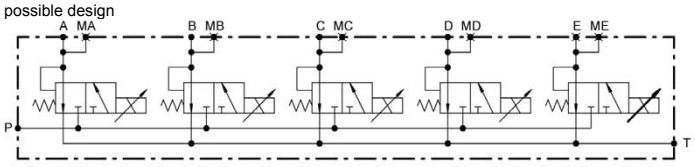
The valve models consist of one or more independently working proportional pressure relief valves. Each valve is supplied through the connection to the pilot control line and provides pilot control connections with a regulated pressure which is proportional to the electrical current.
The proportional pressure relief valve is activated electrically. It is supplied by the pilot control pressure of the machine at connection (VST). This pressure is normally approx. 40 bar and must not exceed 50 bar.
When there is no flow flowing through the coil, the pressure at connection (A) is zero bar or the pilot control connection of the main valve (A) is connected to the leak oil connection (L).
When an unregulated flow flows through attachment of the on-board voltage (12 or 24 VDC), the maximum pressure 20 or 32 bar is set at the connection (A).
The exact proportional pressure setting results through electrical actuation preferably with a power-regulated PWM signal. A temperature drift is thus prevented and good agreement is reached between the setpoint and actual values.
The pressure at the connection (A) is set according to the PWM signal by the regulation function of the pressure relief valve.
In the case of falling pressure at the connection (A) – e.g. through an internal leak in the main valve – it is readjusted to be connected with (VST) by the valve. This also happens when the pilot control pressure at (A) needs to be increased. In the case of intentional reduction of the pilot control pressure at (A), the valve is connected in a regulating manner with the connection (L).

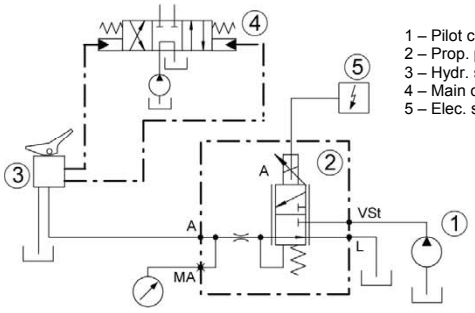
only one function shown



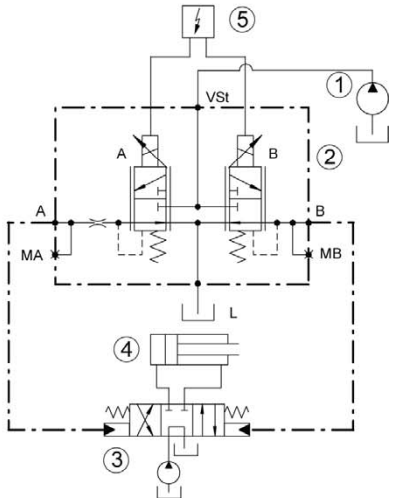
A - Pilot control connections
L - Leakage line
MA -Gauge ports
VSt -Constant pilot control pressure

possible design





1 – Pilot control pump circuit
2 – Prop. pressure relief valve, 1-fold
3 – Hydr. signal transducer
4 – Main control unit
5 – Elec. signal transducer



1 – Pilot control pump
2 – Prop. pressure relief valve, 2-fold
3 – Main control unit, service coil
4 – Consumer
5 – Elec. signal transducer

1.4 Characteristics

- High accuracy
- Linear characteristic line in the adjustment area
- Low hysteresis
- Drift-free in the case of regulated flow of the PWM signal

2 Technical Data

Criteria	Unit	Value
Installation position		Any
Maximum input pressure (VST) or (P)	bar	50
Adjustable pressure at connection (A)	bar	0 .. 20, 0..25 bar, 0 .. 32 bar
Maximum volume flow per valve	l/min	4
Maximum recommended tank pressure (L)	bar	< 1
Hydraulic fluid		Mineral oil (HL, HLP) conforming with DIN 51524, other fluids upon request
Hydraulic fluid pressure range	°C	-20 to +80
Ambient temperature	°C	< +50
Viscosity range	mm^2/s	2.8 - 500
Contamination grade		Filtering conforming with NAS 1638, class 9, with minimum retention rate $\beta_{10} \geq 75$

Supply voltage	VDC
Voltage tolerances	%
Electromagnet power consumption	VA
Electromagnet current consumption	A
Solenoid switch duty cycle	%
Protection class according to DIN 40050	
Current supply	

3 Ordering Information

3.1 Type code

PCV			004	050		000	000000	
00	01	02	03	04	05	06	07	08

00	Product group	Proportional pressure relief valve	PCV
01	Design	standard, 1 function	1N
		standard, 2 function	2N
		standard, 6 function	6N
		including shuttle valve (in the housing), 1 function	1W
		including shuttle valve (externally on the housing), 2 function	2W
		including shuttle valve I (externally on the housing , 6 function	6W
02	Connections	G 1/4 ISO 1179-1 ports A,B **for 1 & 2-function version**	03B
		G 3/8 ISO 1179-1 ports A, B, C, D, E, F, P, T **für 6-function version**	03C
03	Flow rate for 1 function	Qmax 4 l/min	004
04	Max. permissible pressure	Pmax 50 bar	050
05	Actuation	Elektrisch proportional 12 VDC Junior Timer Stecker	12P002
		Elektrisch proportional 24 VDC Junior Timer Stecker	24P002
06			000
07			000000
08	Outlet pressure range (Pmax reduced)	0 ... 20 bar	20
		0 ... 25 bar	25
		0 ... 32 bar	32

XXX – Permanent preset characteristics XXX – Characteristics selectable by customer
■ Available ○ Not available

3.2 Versions currently available

The versions listed below are available as standard. Further versions as part of the options given on the type code can be configured upon request.

Designation	Type Code	Part Nr.
DMV G1/4, 1-FACH, 4 LPM, 50/32 BAR, 12V-PROP	PCV -1N -03B -004 -050 -12P002 -000 -000000 -32	221.211.209.9
DMV G1/4, 1-FACH, 4 LPM, 50/32 BAR, 24V-PROP	PCV -1N -03B -004 -050 -24P002 -000 -000000 -32	221.311.209.9
DMV G1/4, 2-FACH, 4 LPM, 50/32 BAR, 12V-PROP	PCV -2N -03B -004 -050 -12P002 -000 -000000 -32	221.211.205.9
DMV G1/4, 2-FACH, 4 LPM, 50/32 BAR, 24V-PROP	PCV -2N -03B -004 -050 -24P002 -000 -000000 -32	221.311.205.9
DMV G1/4, 2-FACH, 4 LPM, 50/20 BAR, 24V-PROP	PCV -2N -03B -004 -050 -24P002 -000 -000000 -20	221.311.214.9
DMV G3/8, 6-FACH, 4 LPM, 50/32 BAR, 12V-PROP	PCV -6N -03C -004 -050 -12P002 -000 -000000 -32	221.211.212.9
DMV G3/8, 6-FACH, 4 LPM, 50/32 BAR, 24V-PROP	PCV -6N -03C -004 -050 -24P002 -000 -000000 -32	221.311.212.9
DMV G3/8, 6-FACH, 4 LPM, 50/32 BAR, 24V-PROP	PCV -6W -03C -004 -050 -24P002 -000 -000000 -32	221.311.208.9
DMV G1/4, 1-FACH, 4 LPM, 50/32 BAR, 24V-PROP	PCV -1W -03B -004 -050 -24P002 -000 -000000 -32	221.311.217.9

4 Description of Characteristics in Accordance with Type Code

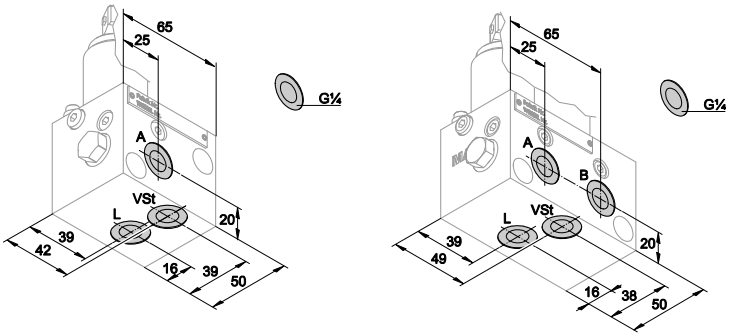
4.1 Characteristic 1: Variant

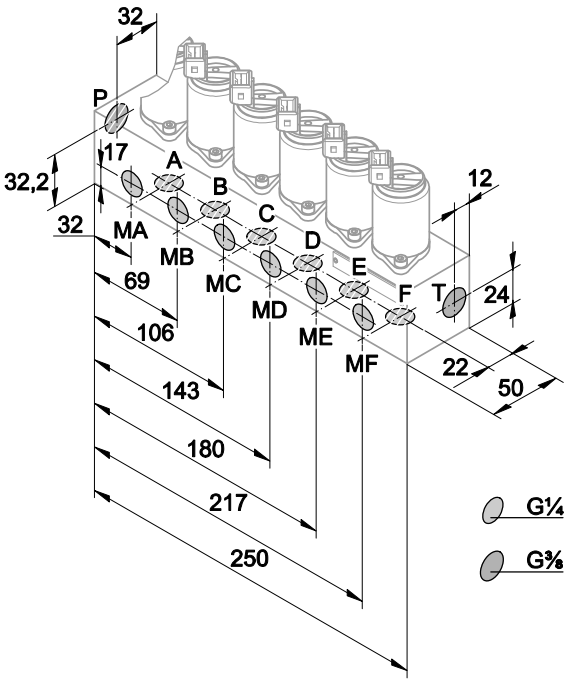
The valve is provided for use in pilot control circuits. The different variants result from arrangement of different numbers of pressure relief valves in different housings.

The addition of a function means an increase in the valve by 37 mm.

4.2 Merkmal 2: Anschlüsse

Connection	Connection sizes
VSt, L, A, B	G ¼“ (ISO 1179-1)
P, T	G 3/8“ (ISO 1179-1)





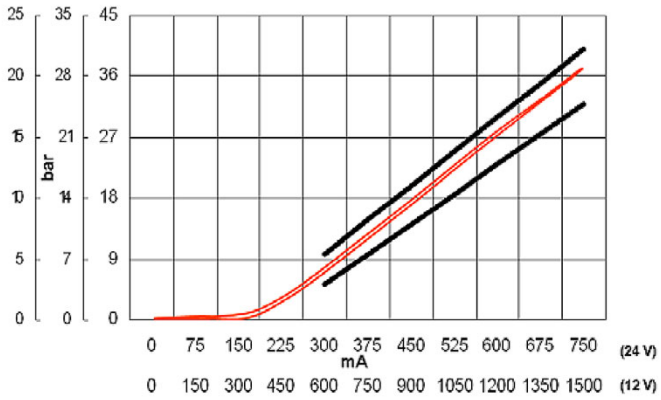
4.3 Characteristic 3: Input flow rate

The maximum volume flow for a pressure relief valve unit is 4 l/min.

4.4 Characteristic 4: Maximum permissible pressure

The maximum permissible pressure at inlet (VST) or (P) is 50 bar.

4.5 Characteristic 5: Characteristic lines pilot control areas



5 Installation

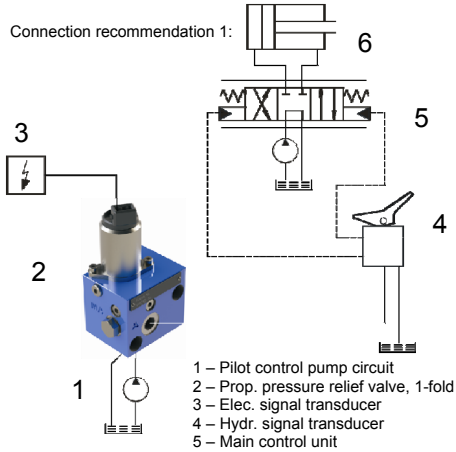
5.1 General remarks

- Only technically permitted changes are to be made on the construction machine.
- The user has to ensure that the device is suitable for the respective application.
- Application exclusively for the range of application specified by the manufacturer.
- Before installation or dismantling, the hydraulic system is to be depressurized.
- Settings are to be made by qualified personnel only.
- May only be opened with the approval of the manufacturer, otherwise the warranty is invalidated.

5.2 Connection recommendations

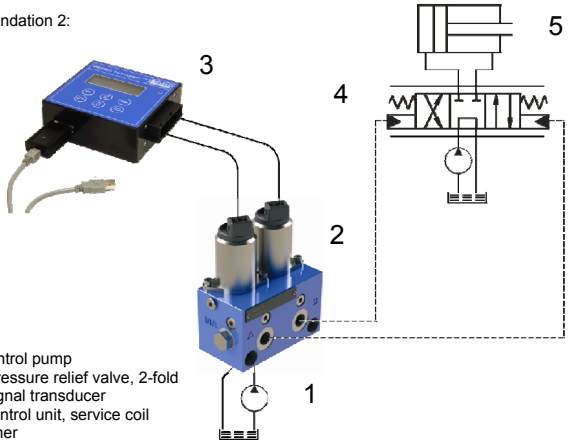
NOTE The included connection recommendations are not guaranteed. The functionality and the technical specifications of the construction machine must be checked. It must be ensured that the construction machine is suitable in terms of technology and safety for the operation of the attachment.

Connection recommendation 1:



1 – Pilot control pump circuit
2 – Prop. pressure relief valve, 1-fold
3 – Elec. signal transducer
4 – Hydr. signal transducer
5 – Main control unit
6 – Consumer

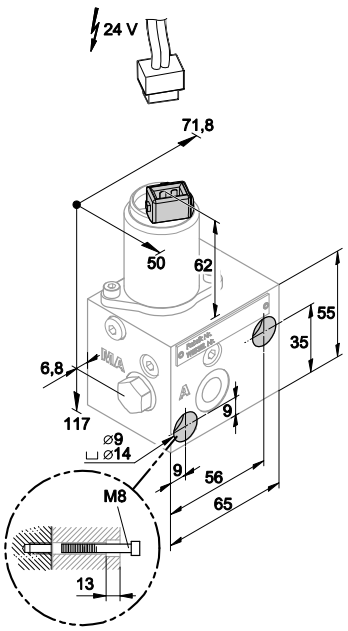
Connection recommendation 2:

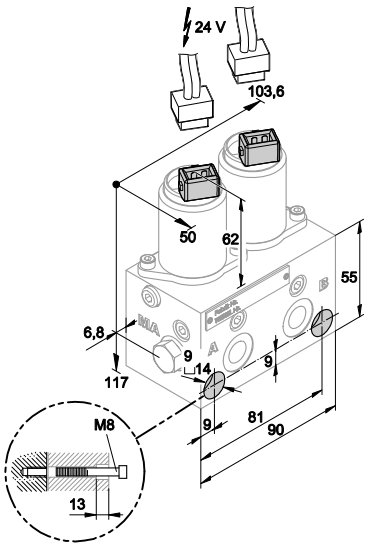


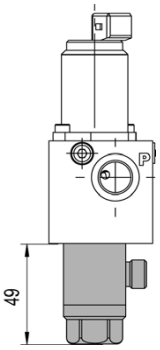
1 – Pilot control pump
2 – Prop. pressure relief valve, 2-fold
3 – Elec. signal transducer
4 – Main control unit, service coil
5 – Consumer

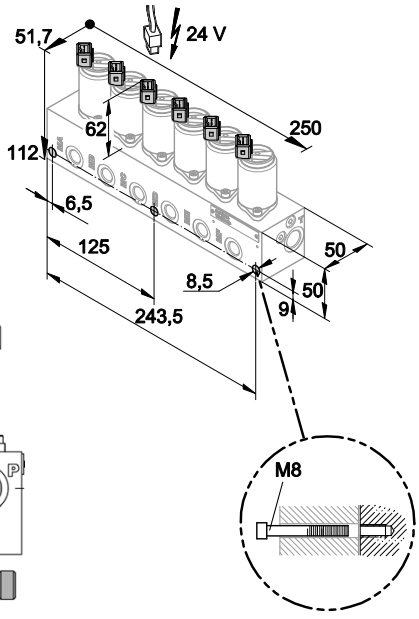
5.3 Installation - space

Example: Single, double and sixfold







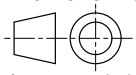


dimensions for shuttle valve
design 2W, 6W

6 Notes, Standards and Safety Requirements

6.1 General remarks

- The views in drawings are shown in accordance with the European normal projection variant



- A comma (,) is used as a decimal point in drawings
- All dimensions are given in mm

6.2 Standards

The following standards must be observed when installing and operating the valve:

- DIN EN ISO 13732-1:2008-12, Temperatures on accessible surfaces

7 Zubehör

- Junior Timer Order No.: 340.305.900.6
- WESSEL Tool Control plus Order No.: 000.310.007.9
- Valve controller Order No.: 000.310.004.9